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ABSTRACT

It is often proposed that high schools are partly to blame for the decline in achievement test scores. Critics of current practices in education cite the decline in Scholastic Aptitude Test (SAT) score averages that has occurred each year since 1963 as evidence. The College Entrance Examination Board Advisory Panel on SAT Score Decline has examined four areas for explanations of the decline: changes in the content of the SAT or errors in equating scores, changes in the testing population, changes in society, and changes in the schools. In this study, the curriculum, institutional, teacher and student factors associated with those schools having large decreases in SAT scores were compared with the same factors in schools with increasing or steady SAT score averages; identifying these factors might provide some insight into the role that school characteristics have played in the score decline. Although some significant differences between the two groups were found in terms of enrollments in academic courses, ability grouping, age of schools, dropout rate, and teacher experience, these do not explain a large portion of the decline. Indeed, differences among schools do not appear to have had large differential effects on the decline of scores. Data collection instruments are included. (Author/EVH)

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A Comparative Study of Secondary Schools with Different Score Patterns

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ABSTRACT

In this study curriculum, institutional, teacher, and student factors associated with those schools having the largest decrease in Scholastic Aptitude Test (SAT) score averages were compared with those factors associated with schools having increasing or steady SAT score averages. It was believed that by identifying these factors, especially those suggested by a listing of hypotheses for the decline developed by the Education and Society Subcommittee of the Advisory Panel on Score Decline, some insight into the role that schools have played in the score decline might come to light. Although some significant differences between the two groups were found in terms of enrollments in academic courses, ability grouping, age of schools, dropout rate, and teacher experience, these were not believed to be an explanation of a large portion of the decline. Indeed the role of schools in the score decline appeared small.

BACKGROUND OF THE STUDY

The idea that in some way high schools are partly to blame for the decline in achievement test scores is often heard. Many who criticize current practices in education are quick to cite the recent decline in Scholastic Aptitude Test (SAT) score averages in support of their claims. In its effort to explain the steady drop in SAT-verbal and SAT-mathematical scores that has occurred each year since 1963, the Advisory Panel on Score Decline has looked in four areas for explanations of the decline. Change in the content of the SAT or errors in the processes used to equate scores on one form to scores on another, change in the testing population, change in the schools, and change in society have been suggested as possible sources of explanation for the score decline. One of the advisory panel subcommittees, the Education and Society Committee, has been concerned with the extent to which changes in secondary school curriculums, institutional policies, teachers, and students may have resulted in the SAT score decline. This study addressed that concern. Its purpose was to find characteristics that distinguished high schools having a severely declining score trend from those having either a steady or increasing score trend. Such characteristics might suggest some conditions in the schools that have led to the score decline.

What might lead one to believe that school characteristics might be a source of the score decline? Frank Armbruster in a draft copy of his report on elementary and secondary education has argued that school policies should be blamed for this decline in scores.[1] Armbruster notes that scores have declined on all types of achievement tests, not only the SAT but also the various achievement tests used in state assessment programs.[2] The resulting patterns of decline have been remarkably similar. Using test data beginning in the 1930s, Armbruster systematically rejects socioeconomic factors, changing family attitudes,

and changing home environments as adequate explanations of the decline. He then asserts that "[t]he 'national IQ' . . . seems to have held relatively constant until 1970." This evidence, he concludes, tends to undermine the theory that "an inherently less talented cohort [is] moving through the school system." Having eliminated all possible sources of the decline other than the school, Armbruster concludes that the source of the decline must lie within the school.

PROCEDURES

Two groups of high schools were identified for the study. One group had undergone a severe decline in SAT scores during the past 10 years; another group had undergone either a steady or even an increasing trend in SAT scores during the same time. Responses to a questionnaire concerning changes in curriculum, institutional policies, students, and teachers were compared for the two groups. Presumably, some clue as to which school factors might be responsible for the score decline would be gained from those questionnaire items where responses differed significantly for the two groups.

Schools in the study were selected by examining SAT score averages earned by students in high schools in 1965, 1969, 1973, 1974, 1975, and 1976.[3] The score data were contained in two files. There was a special data file that contained both SAT score averages and summary statistics from the Student Descriptive Questionnaire (SDQ) for schools having at least 100 SAT registrations in 1973 and 1974. The SDQ asks students to report on their high school curriculums, grades, and interests and is not required when registering for the SAT. The combined SAT and SDQ file contained score averages for each school from 1973 to 1976. Prior to 1973, score data were contained only on yearly history files, which listed examinees and their scores alphabetically.

The only feasible method for gathering a sample of schools was to select a large pool of schools from the 1973-1976 file and then obtain score averages for those schools from the 1965 and 1969 history file. To have used any other method, such as first sorting all students in a file by school for each year, would have been too costly. After completing this process, schools included in the study were further selected on the basis of their score averages for 1965, 1969, 1973, 1974, 1975, and 1976.

Approximately 3,000 high schools were contained in the 1973-1976 file. Only four of those schools were found to have a consistent score gain trend from 1973 to 1976. The remaining schools had a score decline in either verbal or mathematical in at least one year. Therefore, the steady or increasing score average group was selected on the basis of the number of times a school gained on either the verbal or mathematical score average. A total of 331 schools had score increases in at least four of the possible six times. Those schools formed the steady or increasing pool.

Schools with decreasing score averages were easy to find. Two hundred and forty-three schools were found having declines in three consecutive years of at least one-half of a standard error on both the

verbal and mathematical scores. The 99 schools having the largest declines made up the pool of schools with declining scores.

The final sample of schools was selected from the pools by a visual inspection of the score trends. Sixty schools were selected from each group.[4] Ten of the schools in the declining score average group were selected because their scores had the most severe decline. The remaining schools were selected randomly from the pool.

The selection of the steady score schools involved a more complex process. When the 1965 and 1969 scores were combined with those from 1973-1976 for this group, trends from 1965 to 1973 were different from those trends in the 1973-1976 data. Some schools had experienced a decline from 1965 to 1973 and an increase from 1973 to 1976. Most schools had lower SAT scores in 1973 than in 1969. No school in the pool had a consistent, increasing score trend from 1965 through 1976.

In light of the difficulties in defining consistent score patterns for this group, the following selection process was used. The four schools with consistent score increases between 1973 and 1976 were included. The remaining 56 schools were selected because their 1965 and 1969 scores were close to their 1973 scores. Twenty-six of these schools had increases in five out of six times in 1973-1976, while 30 had increases in only four of six times.

The principal of each selected school was mailed a questionnaire. More than 90 percent of the principals who returned questionnaires said that they had been at the same school in 1965. If the principal had come to the school after 1965, he was asked to consult with either a guidance counselor or teacher who had been there in 1965. The questionnaire was developed from a list of hypotheses drafted by the Education and Society Subcommittee in February 1975, which identified possible causes of the SAT score decline related to school and society.[5] Among the hypothesized causes of the decline related to changes in schools were:

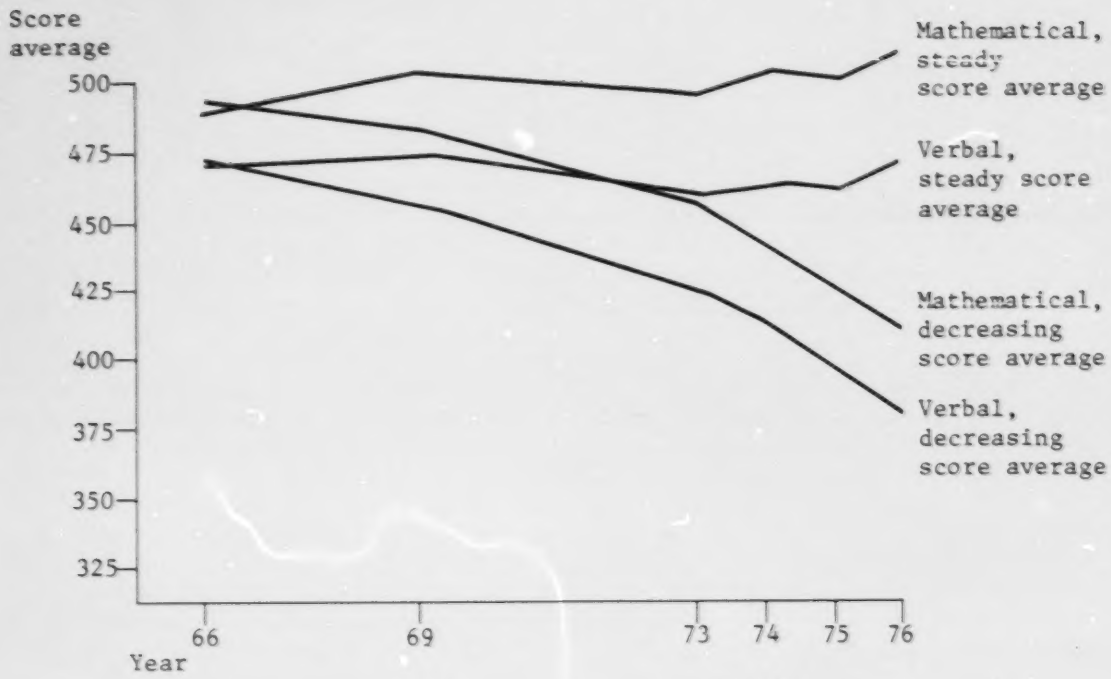
1. Curriculum changes--e.g., decline in foreign language study, decreased emphasis on reading and writing skills, and open classrooms.
2. Institutional policies--e.g., de-emphasis on grades, less homework, increased retention in high school, and failure to "track" students.
3. Teachers--e.g., more clerical aides, less contact with students, and permissiveness of teachers.
4. Students--e.g., decline in competitiveness, truancy, alcohol, and drug abuse problems.

An attempt was made to write a questionnaire item concerning each hypothesis. Sometimes this was impossible. Principals either were thought not able to provide reliable answers to some questions or the hypotheses concerned areas not directly associated with the high school (e.g., whether reading programs used phonics). A copy of the questionnaire is appended.

Characteristics of the Schools and Examinees

Because the SAT history file contained no background data for examinees in 1965 and 1969 during the process of selecting schools, it was impossible to control for pre-existing differences between the schools with steady and decreasing score averages in terms of sex, racial com-

Figure 1. Score Averages for Schools in the Sample



position, and socioeconomic status. Figure 1 shows the score trend in SAT-verbal and mathematical averages for the schools returning questionnaires.[6] The figure shows that each group had about the same verbal and mathematical scores in 1965. From that point on, the score average for the decreasing group of schools began to drop. This drop has continued through 1976, for a total of almost 100 points, or one standard deviation, in 10 years. Meanwhile, the steady score average schools maintained, or slightly increased, their scores during the same time.

How did the two groups of schools differ? Analysis of questionnaire responses indicated that the schools with steady scores currently have slightly higher socioeconomic status than schools with decreasing scores, although the difference was not statistically significant.[7] According to principals in the decreasing score schools, an average of about 20 percent of their school's enrollment in 1965 consisted of minority students.[8] This average had grown to be about 35 percent in 1976. Large minority enrollments were not found in the schools with steady score averages. About 6 percent of their 1965 enrollment and 8 percent of their 1976 enrollment were minority students. Not only did minority enrollment in the decreasing score schools increase between 1965 and 1976, but the proportion of students who were minority students and took the SAT from 1973 to 1976 increased as well. Analysis of the SDQ data

shows that in 1973, 26 percent of the SAT examinees from the schools with decreasing scores were minority students. This grew to 37 percent in 1976. These statistics should be compared with 5 percent SAT examinees for both 1973 and 1976 in the steady score average schools.

The academic backgrounds of students who have taken the SAT may have changed also. In 1973 about 21 percent of the students from each type of school said they were ranked in the top 10 percent of their class according to the SDQ responses. By 1976 only 16 percent of the students from schools with decreasing scores said they were in the top 10 percent of their class. The percentage of students in schools with steady scores who said they were in the top 10 percent grew from 21 to 23 percent. The difference between the two groups in 1976 and the difference between the two changes from 1973 to 1976 were both statistically significant.

Grade-point averages as reported on the SDQ were also different for the two groups.[9] Students taking the SAT in schools with steady scores tended to have higher grade-point averages than did those taking the SAT in schools with decreasing scores. This was true for both years. Nonetheless, while grade averages were about the same in the two years for schools with decreasing scores, grade averages for the schools with steady scores had increased.

Changes in Curriculum

Although there is little existing empirical evidence to attribute the decline in test scores to changes in the school curriculum, change in the school curriculum is often cited as a cause of the score decline.[10] In a report on the achievement test score decline, Harnischfeger and Wiley reported statistics from a National Center for Educational Statistics curriculum survey that indicated there have been declining enrollments in traditional academic courses, such as advanced mathematics, English, and foreign language courses.[11] Armbruster places more emphasis for the decline on such things as the attitudes of educators, institutional policies, and teachers. Nevertheless, he concludes ". . . considerable changes will probably be necessary in our current curriculum, particularly if we must reinstitute teaching methods which have been successful in the past."[12]

The members of the Education and Society Subcommittee identified several possible hypotheses from research reports and informal communication regarding how curriculum factors may have caused the score decline. Possible causes of the decline that were identified included the neglect of basic skills, effects of "new math," decline in academic course enrollments, use of newer textbooks that are more concerned with style than with content, and the like.

Analysis of the questionnaire items bearing on the curriculum hypotheses leads to the conclusion that changes in the curriculum explain little of the SAT score decline for this study's sample of schools. Both the schools whose scores have decreased and those whose scores have increased have adopted audiovisual aids, new textbooks, open classrooms, and nontraditional course offerings--e.g., modern film, photography, and studio arts--to about the same degree.[13] Both have been slow in adopting the emphasis of concepts over calculations in mathematics classes.[14]

Only 24 percent of the schools with decreasing scores and 18 percent of the schools with steady or increasing scores indicated that they made a major effort to emphasize concepts rather than calculation in mathematics classes.

Adoption of work-study programs and pass-fail graded courses did not account for any significant difference between the two groups of schools. In fact schools with steady score averages were more likely to have made a major effort to adopt work-study programs and pass-fail graded courses than were schools with decreasing score averages. Seventy-seven percent of the steady score average schools had made a major effort to adopt work-study programs, compared with 42 percent for the decreasing score schools. These statistics fail to support the committee's hypothesis that independent study--i.e., work-study programs and pass-fail graded courses--lead to a decline in score averages.[15]

A statistically significant result was found for the questionnaire item regarding "basis skills." The result, however, was not what was expected from the hypothesis. Rather than an indication of neglect of the "three Rs" by schools with decreasing score averages, just the opposite was found. Sixty-one percent of schools with decreasing scores said they had made a major effort to emphasize teaching the basic skills, while only 37 percent of the schools with steady score averages said the same.[16] This result leads one to speculate that the new emphasis on basic skills represents more a reaction to the score decline than a cause of the score decline.

The increased popularity of the "back to basics" curriculum on the part of schools with decreasing score averages is further illustrated by findings concerning what is taught in English classes. Although the results are not statistically significant, it appears that schools with decreasing scores may be placing more emphasis in their English classes on vocabulary development, grammar, sentence structure, and punctuation.[17] Both decreasing and steady score average schools have emphasized essay writing, reading nineteenth century literature, and reading contemporary literature to the same extent.[18]

Enrollments in foreign language classes have been decreasing throughout the country during the time the SAT score average has declined. Responses from the questionnaire indicate that foreign language enrollments have declined about the same extent in both decreasing and steady score average schools. Only 39 percent of the schools with decreasing scores and 49 percent of the schools with steady scores said their enrollments in modern foreign language--e.g., Spanish and French--have not declined appreciably in the last 10 years. Only 15 percent of the schools with decreasing scores and 24 percent of the schools with steady scores said their enrollments in the classical languages have not appreciably declined. Differences in the enrollment patterns between the two types of schools were not found to be significant.[19]

There was some evidence from mathematics course enrollments that indicated a difference between schools with decreasing and steady score averages. Enrollments in higher mathematics courses had declined to a greater extent for schools with decreasing score averages than they had for schools with steady score averages. For example, 39 percent of the schools with decreasing score averages compared with 18 percent of the schools with steady score averages indicated a decline in enrollments in advanced mathematics courses since 1965. More

striking, 33 percent of the schools with decreasing score averages compared with only 6 percent of the schools with steady score averages said their enrollments in geometry had declined in the past 10 years. The finding for geometry, which suggests a possible cause of the score decline, was statistically significant.[20] No significant differences between schools with decreasing and steady score averages were found in enrollment changes for senior year English and nonacademic courses such as journalism and creative writing.[21]

Some evidence that may clarify the role that course selection plays in the score decline was gathered from the analysis of SDQ responses to a question regarding the number of years students took courses in various academic areas. In general, responses to the SDQ indicate that students from schools with steady score averages took about the same number of years of English, mathematics, foreign languages, and physics in 1976 as they did in 1973. Not only did their years of study in these areas remain about the same, but students from steady score average schools also had more years of study in these areas than did students from decreasing score schools. Students from decreasing score schools had more courses in biology during both years, however. Summary statistics are presented in Table 1. Table 2 gives summary statistatics for the questionnaire items regarding curriculum.

Changes In Institutional Policies

Unlike the findings concerning curriculum changes, more statistically significant differences were found between the groups on questionnaire items covering institutional policies. Some of the significant findings, however, contradicated the committee's hypotheses. For example, increasing school enrollment, suggested as a possible cause of the score decline, was more characteristic of those schools with steady score averages than it was of those schools with decreasing score averages. Enrollments in schools with decreasing score averages were about 1,800 in 1965 compared with 1,740 in 1975; enrollments in schools with steady score averages were about 1,230 in 1965 compared with 1,440 in 1975. Although enrollments in schools with decreasing scores were greater than those for schools with steady scores in 1965, a time when both types of schools had about the same scores, enrollments in the former have declined slightly, while enrollments in schools with steady scores have increased about 17 percent.[22] At the same time, both groups of schools have had to reduce their teaching staffs.[23]

No evidence was found to support the hypothesis that increased retention in high school--indicated by a declining rate of dropout from high school--contributes to the SAT score decline.[24] The thought underlying the hypothesis is that as lower-achieving students drop out, instruction can be geared more to the higher-achieving students who typically take the SAT so that higher test scores will result. Analysis of the questionnaire data leads to a different conclusion. Fifty-two percent of the schools with decreasing score averages reported increases in their dropout rate since 1965 compared with that of only 12 percent for steady score average schools.[25] This result suggests that rather than having a positive influence on SAT scores, an increase in the dropout rate indicates either a change in the type of students in the school or some problem within the school.

Table 1. Average Number of Years Courses Were Taken in Six Areas***

Course/year	Male		Female	
	Decreasing score average	Steady score average	Decreasing score average	Steady score average
English:				
1973	3.9	4.0	3.9	4.0
1976	3.8*	4.0	3.9	4.0*
1973-1976.	.1	.0	.0	.0
Mathematics:				
1973	3.5	3.6	3.2	3.2
1976	3.4	3.6**	3.1	3.3*
1973-1976.	.1	.0**	.1	-.1**
Foreign Language:				
1973	2.5	2.3	2.7	2.7
1976	2.2	2.5	2.4	2.6
1973-1976.	.3	-.2**	.3	.1*
Physical science:				
1973	1.5	1.8**	1.0	1.2*
1976	1.6	1.9**	1.3	1.5**
1973-1976.	-.1	-.1	-.3	-.3
Biological science:				
1973	1.4	1.3**	1.4	1.3*
1976	1.6	1.4**	1.6	1.4*
1973-1976.	-.2	-.1	-.2	-.1
Social science:				
1973	3.3	3.3	3.1	3.3
1976	3.1	3.2	3.0	3.2
1973-1976.	.2	.1	.1	.1

*Indicates significant difference between decreasing and steady score schools, p = .05
**Indicates highly significant, p = .01
***Based on 4 years of secondary school; entries are rounded to one decimal

Analysis of the data regarding institutional policies also leads one to reject hypotheses such as the "edifice complex,"[26] a de-emphasis on grades, and less homework as contributing much to the SAT score decline. Although schools with decreasing score averages were found to have older buildings than those with steady score averages (73 percent of the schools with decreasing scores said their buildings were over 20 years old, while only 37 percent of the schools with steady scores said the same), only two schools from the steady score group had buildings less than five years old, and only 11 had buildings less than 10 years old.

The average per-student cost, which is related to the notion of the "edifice complex," was found to be virtually identical for the two groups in 1976.[27] Nevertheless, if schools with decreasing score averages were getting more lower socioeconomic status students, they may have needed

Table 2. Percentages of Schools in Each Group Responding as Indicated

Item response	Percent decreasing score average	Percent steady score average	Statistically significant difference
Have made a major effort to adopt or expand:			
Basic skills	60.6	36.7	Yes
Audiovisual aids	45.5	49.0	No
Essay writing	45.5	40.8	No
Vocabulary development	48.5	28.6	No
Work-study programs	42.4	67.4	No
New textbooks	60.6	51.0	No
Concepts in mathematics	24.2	18.4	No
Contemporary literature	39.4	16.3	No
Have made some effort to adopt or expand:			
Content in writing	42.4	612.	No
Pass-fail grading	27.3	28.6	No
Open classroom	48.5	40.8	No
Nontraditional courses	72.7	65.3	No
19th century literature	60.6	59.2	No
Schools indicating a decline in enrollment:			
Modern foreign language	60.6	51.9	No
Classical languages	84.9	75.5	No
Advanced math	39.4	18.4	No
Geometry	33.3	6.1	Yes
Senior English	15.2	24.5	No
Journalism, creative writing	27.3	16.3	No

increased funds per student; if they did not receive these funds, that might in part account for their decreasing scores. No evidence was found substantiating the claim that a de-emphasis on grades explains much of the decline. There was general agreement among all the schools in each group that students in their schools in 1965 were more motivated to get higher grades than were students in their schools in 1976. Only six percent of the schools with decreasing scores and 10 percent of the schools with steady scores believed their students were more motivated to get high grades in 1976 than in 1965.[28]

As with the emphasizing of "basic skills," school policies on homework had changed to a different extent for the two groups. Perhaps as a reaction to the score decline, schools with decreasing scores indicated that they had placed more emphasis on homework assignments.[29] Thirty-nine percent of the schools with decreasing score averages compared with only 14 percent of the schools with steady score averages said that they had made a major effort to increase the amount of homework for their students.

One major finding substantiating a hypothesis to the score decline was found regarding how students are grouped within the schools. Thirty-three percent of the schools with decreasing scores said that they had made major efforts to adopt mixed-ability or heterogeneous class grouping during the last 10 years. Ten percent of the schools with steady scores said they had adopted similar efforts. The difference between the two groups was statistically significant.[30]

Results of all the analyses regarding institutional policies are summarized in Table 3.

Changes in Teachers

Most of the principals responding to the questionnaire said that, in many ways, their teachers had changed. Teachers in both groups of schools were reported to have used teacher aides more frequently, been less dedicated, had more formal education, had less desire to enforce high academic standards, been more permissive, spent less time outside

Table 3. Summary Statistics for Questionnaire Items Regarding Institutional Policies

Item response	Decreasing score average	Steady score average	Statistically significant difference
Made a major effort to adopt:			
Mixed ability grouping	33%	10%	Yes
Homework assignments	39%	14%	Yes
1975 students more motivated to get higher grades	6%	10%	No
Schools over 20 years old	73%	37%	Yes
Increased dropout rate	52%	12%	Yes
Staff reductions	45%	45%	No
Cost per student			
1965	$509	$509	No
1976	$1,230	$1,350	No
1976-1965	$721	$844	No
Enrollment			
1965	1,800	1,230	Yes
1976	1,740	1,440	No
1976-1965	-60	210	Yes

class with students, and placed less emphasis on classroom discipline in 1976 than their counterparts did in 1965. These changes were found equally in schools with decreasing and steady score averages. No statistically significant differences were found between the two groups of schools on items concerning use of teacher aides, dedication to teaching, education beyond the bachelor's level, desire to enforce academic standards, permissiveness, motivation to spend time with students outside class, desire to be liked by students, and emphasis on discipline.[31]

Analysis of the questions that asked principals to compare the teachers in their schools in 1976 with those of 1965 resulted in finding only one statistically significant difference between the two groups of schools.[32] In general, teachers in schools with steady scores tended to have more experience than did teachers in schools with decreasing scores. Forty-seven percent of the schools with steady scores reported that having teachers with five or more years' experience was more common in 1976 than in 1965. Twenty-one percent of the schools with decreasing score averages reported the same. It should be kept in mind that between 1965 and 1976 enrollments at the decreasing score average schools remained steady, or declined slightly, while enrollments at the steady score average schools increased. On the one hand, such a change in enrollments suggests that more new teachers would be added to the steady score schools, resulting in fewer teachers having more than five years' experience in 1976. On the other hand, results concerning teaching experience suggest that teacher turnover is greater in the schools with decreasing score averages than in the schools with steady score averages. A large group of teachers may have retired at the decreasing score average schools, which could account for the result. Another possibility, which is supported by other evidence, is that conditions in the school environment--e.g., a different type of student--may contribute to the relatively higher turnover at the decreasing score schools.

A summary of the findings concerning teachers appears in Table 4.

Changes in Students

Student populations in 1976 have changed since 1965, just as teachers have changed. The majority of principals responding to the questionnaire said that students in their schools in 1976 were more often truant, discipline problems, alcohol and drug abusers, and delinquent than students in their schools were in 1965. Students in 1965 were perceived as competing harder to get into certain colleges, motivated more to score high on college admissions tests, feeling more that education was important preparation for a good job, and enjoying educational activities for their intrinsic values. The perceptions reported by principals from schools with decreasing scores paralleled those reported by principals from steady score schools.[33] Alcohol and drug problems were cited more frequently as being major problems in 1976 for the steady score average schools, although the difference between the two groups of schools was not statistically significant.

Summary statistics are presented for the questionnaire items concerning students in Table 5.

Table 4. Summary Statistics for Questionnaire Items Concerning Changes in Teachers

Questionnaire item	Percent decreasing score average	Percent steady score average	Significant difference
Made a major effort to use teacher aides	12	20	No
More characteristic of teachers in 1976 than in 1965:			
Dedication	6	8	No
Experience (5 years)	21	47	Yes
Education beyond bachelor's	55	74	No
Enforcing academic standards	0	8	No
Permissiveness	70	82	No
Reliance on aides	52	57	No
Spend time with students outside of classroom	21	16	No
Desire to be liked by students	46	45	No
Emphasis on discipline	6	2	No

Table 5. Summary Statistics for Questionnaire Items Concerning Students

Questionnaire item	Percent decreasing score average	Percent steady score average	Significant difference*
More characteristic of students in 1976 than in 1965:			
Truancy	82	65	No
Discipline problems	64	59	No
Alcohol and drug abuse	70	88	No
Crime, juvenile delinquency	82	71	No
More characteristic of students in 1965 than in 1976:			
Competition to get into college	58	39	No
Motivation to score high on tests	58	37	No
Education as preparation for job	46	41	No
Enjoyment of education	58	35	No

*Chi-square values calculated in the order they are given in Table 5 are 2.66, .16, 4.09, .59, .01, 3.82, .90, and 4.22.

How Principals Interpret the SAT Score Decline

The SAT means different things to different people. The College Board says that the SAT provides a measure of verbal and mathematical reasoning abilities that are needed to get good grades in college. A student's score provides a valid indication of how well he will do in college. The SAT means other things to other people. Many say that the SAT, or for that matter any standardized test, reflects the culture and family background of the student more than his ability to do college work.[34] The SAT measures a general level of academic achievement attained during high school according to those who use the SAT score decline as evidence of an invasion of rash or foolish new teaching methods or school policies in the school.

This difference of opinion--on what SAT scores indicate--is reflected in the responses to the questionnaire. When asked to indicate which of three characteristics--general achievement in high school, ability to do college work, and cultural or family background--was best measured by the SAT, 27 percent of the entire sample said the SAT best reflects the cultural and family background of the studen.. This feeling was most prevalent among principals of schools with decreasing scores, where 41 percent so indicated, compared with only 17 percent for the steady score schools. Fifty-five percent of the principals from steady score average schools said that they believed that the SAT best reflected a student's "ability to do college-level work." Only 28 percent of the principals from the declining score average schools said the same.[35] One can see that the principals from the two groups of schools believe the SAT measures different things. Principals from schools with decreasing scores believe that the SAT best reflects the cultural and family background of the students; principals from schools with steady scores believe that the SAT best reflects the ability to do college work.

The issue of the SAT score decline and what to do about it have received differing amounts of attention in the sample of schools. The score decline has naturally been a more important issue in the schools with decreasing scores than it has in the schools with steady scores. For example, the SAT score decline was reported to be a major issue in 85 percent of the schools with decreasing scores. Only 18 percent of the steady score average schools said that the score decline was a major issue. Although the SAT score decline has been an issue in the decreasing score school districts, most principals believe that it will have only a moderate impact on educational practices in their districts. Of those principals who said that the SAT score decline was a major issue, only 13 percent said that they believed the decline would have a major effect on educational practice. Apparently principals in schools with declining scores feel that the factors causing the score decline are not under their control.

Summary and Comments

In this study few of the hypotheses advanced for the score decline by the Education and Society subcommittte were supported by the results.

Curriculum factors seemed to exert only a moderate effect. Although both schools with declining score averages and those with steady score averages reported similar decreases in academic course enrollments (with the exception of geometry enrollments), there was some evidence from the analysis of the SDQ that SAT examinees from schools with steady scores now take more academic courses (e.g., English, mathematics, foreign language, and physical science) than SAT examinees in decreasing score schools. The trend has been for examinees in steady score schools to take more of these courses than their predecessors, while examinees in decreasing score schools either take fewer or about the same number of these courses than their predecessors. Open classrooms, independent study, and new methods for presenting material seem to have had little effect on the score decline.

Institutional policies for the two groups of schools provided for the best discrimination between the two groups. Schools with steady score averages tended to use homogeneous grouping more frequently, had newer school buildings, and have a decreasing dropout rate. Schools with decreasing score averages tended to use heterogeneous grouping more frequently, have older school buildings, and an increasing dropout rate. In an apparent attempt to change the declining achievement trend in their schools, homework assignments and basic skills have been emphasized by schools with decreasing score averages.

Few significant differences were found between teachers in the two groups of schools. Teachers in both groups were generally regarded as less dedicated, more permissive, and less willing to enforce academic standards in 1976 than they were in 1965. In 1976, however, schools with steady score averages reported having had more teachers with five or more years' experience than in 1965. This increase in experience was a significant characteristic of schools with steady scores.

Perceptions of how students have changed since 1965 were also similar for both groups. In 1976 students were viewed as being less motivated to score well on tests and having more behavioral problems (e.g., alcohol, truancy, juvenile delinquency). Nonetheless, there was no significant difference between the two groups.

What might be made of these results? One might say that little has been proved. The questionnaire that was used may have been insensitive to many school effects causing the decline. The sample size may have been too small. The principals might have given unreliable or invalid responses. Each of these is possible.

To the author's knowledge, only one other study has been performed that uses the methodology employed in this study.[36] In that study a sample of Massachusetts schools was chosen and the investigation was limited to four variables: (1) number of academic courses offered; (2) enrollments in science fiction and radio and television courses; (3) age, years of experience, and educational level of the teaching staff; and (4) pupil-teacher ratios. The results of that study indicated that schools with higher rates of decline had fewer course offerings in the academic subjects, presumably indicating higher enrollments in these courses. If this were so, it would support the findings of this study, at least in the case of mathematics and geometry course enrollments. No significant differences were found for the course enrollments, teacher variables, or pupil-teacher ratios in the Massachusetts study. With the exception of the finding regarding teaching

experience, the results of this study are much the same as were those of the Massachusetts study.

Some significant factors associated with schools that may explain the SAT score decline were found in this study. Nevertheless, these factors act in complex ways that cannot as yet be explained. Some factors may be causes of the decline, while others are effects of the decline. Taken by themselves, they cannot explain the score decline. Although one might quibble over the degree of assuredness in the remarks by Sidney P. Marland, Jr., president of the College Board, on the effects of schools on the score decline that he made in announcing the creation of the Advisory Panel on Score Decline, it is difficult to deny his assertion that "To single out the schools as being responsible for the decline is unwarranted, unfair, and scientifically unfounded."[37]

NOTES

1. Armbruster, F., The U.S. Primary and Secondary Educational Process. Final draft. HI-2308 RR. Croton-on-Hudson, N.Y.: Hudson Institute, 1975.
2. For example, in both Hawaii and Iowa, score averages have declined on state assessment tests. Hawaii uses the School and College Ability Test (SCAT) and the Sequential Test of Educational Progress (STEP) as its assessment instrument; Iowa uses the Iowa Test of Educational Development (ITED) in its assessment.
3. The years designated refer to school years ending in the designated year. Thus, 1965 actually refers to the 1964-65 school year. Because the process used to get score averages for schools from 1963 to 1972 was so expensive, only two years were included from that period.
4. The final selection of 60 schools from each pool was made because it was desired to have the two groups be as different as possible in terms of score patterns. Had more schools been included in the study, the disparity between the two groups would have been reduced, and it was believed that the questionnaire used in the study would not have been sensitive enough to pick up differences between the two groups.
5. Wharton, Yvonne L., Hypotheses Advanced to Explain the SAT Score Decline. Prepared for the Advisory Panel on Score Decline. N.Y.: College Entrance Examination Board, 1977.
6. Eighty-two percent of the schools with steady score averages returned questionnaires. Fifty-five percent of the schools with decreasing score averages returned questionnaires.
7. Socioeconomic status was based on the reports of principals of the amount of ESEA Title I funds received, type of housing found in the community, and the proportion of students from homes earning more than $20,000 a year.
8. Blacks, Mexican Americans, Puerto Ricans, American Indians, and Orientals were considered minority students.

9. Means and significance tests for grade point averages were:

	Steady score	Declining score	t-value	P
a. Average in 1973	3.08	2.98	2.28	.025
b. Average in 1976	3.18	2.98	5.08	.001
c. 1973-1976	-.10	.00	3.54	.001

10. "Crisis in the schools." U.S. News and World Report, Vol. 79, September 1, 1975, pp. 42-48

11. Harnischfeger, A., and Wiley, D., "Achievement Test Scores Drop. So What?" Educational Researcher, March 1976

12. Armbruster, F., The U.S. Primary and Secondary Educational Process, Final draft. HI-2308 RR. Croton-on-Hudson, N.Y.: Hudson Institute, 1975. p. 293. Armbruster says that there was not an agreement among those providing him with advice on how much change in the curriculum would be required to reverse the trend in score averages.

13. This conclusion is based on chi-square analyses of the 2 X R contingency tables having type of school--i.e., declining score average and steady score average--and response category as the classifying variables. In many instances categories of response were combined so that there were at least five responses in each cell of the table. The specific items and their calculated chi-squares are:

1. Use of audiovisual aids in the classroom, $\chi_1^2 = .10$
2. Use of new edition textbooks $\chi_1^2 = .73$
3. Use of open classrooms, $\chi_1^2 = .47$
4. Nontraditional course offerings, $\chi_1^2 = .50$

The subscripts represent the number of degrees of freedom for the test.

14. Questionnaire item "Emphasis on concepts rather than calculation in mathematics classes," $\chi_1^2 = .41$

15. Although the finding regarding work-study programs was strong, it was not statistically significant. Items were:

work-study programs, $\chi_2^2 = 5.13$

pass-fail or credit-only grading, $\chi_2^2 = .02$

16. Questionnaire item: "Emphasis on teaching the basic skills," $\chi_1^2 = 4.5$, $p = .05$

17. Items include:

"Emphasis on vocabulary development," $\chi_1^2 = 3.36$

"Emphasis on content rather than form in essay writing--i.e., decreased emphasis on grammar, sentence structure, punctuation," $\chi_1^2 = 2.79$

18. Questionnaire items include:

"Essay writing in English class," $\chi_1^2 = .17$

"Stress on 19th century literature," $\chi_1^2 = .02$

"Stress on contemporary literature," $\chi_1^2 = 2.91$

19. Questionnaire items asked for an indication of a five-point scale of the growth or decline in enrollments since 1965. Chi-square values were:

a. Modern foreign language, $\chi_4^2 = 1.36$

b. Classical languages, $\chi_4^2 = 1.05$

20. Significance tests showed chi-square values of:

a. Advanced mathematics--e.g., advanced algebra, trigonometry, $\chi^2_2 = 4.64$

b. Geometry, $\chi^2_2 = 10.8$, $p = .05$

21. Senior year English, $\chi^2_2 = 1.01$; Journalism, creative writing, $\chi^2 = 2.28$

22. The difference in 1965 between enrollments for the two groups is significant at $p = .01$. The differences in 1975 are not significant.

23. Although no data were collected on teacher-pupil ratios, each school was asked to report the extent of any staff reductions or increases. Many of these data were reported on the basis of impressions and hearsay. This led to a decision to code the staff reduction question as a dichotomous item: a school either had or did not have a staff reduction during 1965-1976. Chi-square analyses were not significant for this item.

24. See Harnischfeger and Wiley.

25. Respondents were asked to indicate whether the dropout rate for their school had generally increased, decreased, or remained the same since 1965.

26. The "edifice complex" refers to the "delusion that better schools require shinier physical plants, grander stadiums, fancier equipment, etc. (see list of hypotheses)." It is difficult to use this hypothesis to explain the difference between the two groups of schools in this study. If new schools represent a delusion of better education, one might expect schools with decreasing score averages to be more deluded--i.e., have newer buildings--than would schools with steady score averages.

27. Average per-student costs were $509 (1965) and $1,230 (1976) for the declining score schools and $506 (1965) and $1,350 (1976) for the steady score schools. Differences between the costs for the two groups in each year, as well as the gain, were not statistically significant.

28. There was no significant difference between the two groups in their responses. $\chi^2_2 = 2.74$

29. Item was "use of homework assignments to supplement classroom instructions," $\chi^2_1 = 6.74$, $p = .01$

30. $\chi^2_1 = 7.76$, $p = .05$

31. Conclusions were based on chi-square analysis of 2 X 3 contingency tables. Items and chi-square values were:

1. Use of teacher aides	$\chi^2_2 = 3.96$
2. Reliance on teacher aides.	$\chi^2_1 = .01$
3. Dedication to teaching	$\chi^2_2 = .10$
4. Education beyond bachelor's.	$\chi^2_2 = 4.10$
5. Enforce academic standards	$\chi^2_1 = 1.27$
6. Permissiveness	$\chi^2_1 = .01$
7. Spend time with students	$\chi^2_1 = 1.09$
8. Desire to be liked by students	$\chi^2_1 = .10$
9. Emphasis on discipline	$\chi^2_1 = .15$

32. $\chi^2_2 = 8.81$, $p = .05$

33. None of the statistical analyses yielded significant values of chi-square.

34. See, for example, E. Sharp, The IQ Cult, New York, Coward, McCann, and Geoghegan, 1972.

35. $\chi^2_2 = 7.74$, $p = .05$

36. Weinman, J. J., Declining Test Scores: A State Study. Draft of a report prepared by the Massachusetts State Department of Education, December 1976, p. 76-81

37. ATP News, January 1976, College Entrance Examination Board, p. 2

School Information Questionnaire

As you may have read, test scores on the two major tests used for college admissions--the SAT and the ACT--have been declining. In the case of the SAT this decline began around 1965 and has continued through the current year. The decline first became apparent in the late 1960's when it was attributed mainly to an increase in the number of college-bound students taking the test. It was believed that more lower scoring students were going on to college and that these students were depressing the score average. In about 1970, however, the number of students taking the SAT began to steady. Nevertheless, SAT score averages have continued their downward trend.

In an attempt to gain some understanding of the score decline, the College Entrance Examination Board established an Advisory Panel on Score Decline chaired by former Secretary of Labor, Willard Wirtz. During the past year, the Panel has sponsored a number of studies aimed at providing information about possible explanations for the decline. Among the possibilities under investigation are: 1) deficiencies in the way the tests are constructed; 2) changes in society; and 3) changes in the school environment. The current study falls into the third area: its purpose is to determine if there is any link between the characteristics, policies, and resources of a school and its prevailing score trend.

On the following pages you will find questions concerning your high school. Please answer each question as accurately as you can. If you need to consult with other school members--e.g., an English teacher, a mathematics teacher, and so on--I urge you to do so. Each of your answers is important to the study. Nonresponse introduces bias into our findings and diminishes the study's ultimate value.

After the data are collected, a report will be developed for the Panel sponsoring the study. You will also receive a copy of this report. At no time will the names of the schools returning questionnaires be revealed; all of your responses will be kept in strictest confidence.

I thank you for your anticipated cooperation in this matter.

Gary J. Echternacht
Research Psychologist

1. What grades does your school serve?

_____a. Grades 9-12

_____b. Grades 10-12

_____c. Grades 11-12

_____d. Other (Specify: _____)

2. About how old is the major classroom building of your high school?

_____a. Less than 2 years old

_____b. 2 to 5 years old

_____c. 6 to 10 years old

_____d. 11 to 20 years old

_____e. over 20 years old

3. Do students in your high school have to meet a certain level of performance on standardized tests before they are allowed to graduate?

_____a. Yes

_____b. No

4. If your school received any Federal funds from the Elementary and Secondary Education Act (ESEA) in the school years 1972-1973 and 1975-1976, please indicate the amount received.

	1972-1973	1975-1976
a. Title I: Education of children from low income families	$_____	$_____
b. Title III: Supplementary education centers and services	$_____	$_____
c. Title VI: Education of the handicapped	$_____	$_____
d. Title VI: Bilingual education programs	$_____	$_____
e. Title VIII: General provisions	$_____	$_____

5. Check the category that best describes the community in which your high school is located:

_____a. Large central city (population over 500,000)

_____b. Large city (population 100,000 to 500,000)

_____c. Medium-sized city (population 50,000 to 100,000)

_____d. Suburb of a central, large, or medium-sized city

_____e. Small city (population 25,000 to 50,000)

_____f. Small town (population 10,000 to 25,000)

_____g. Rural area

6. Check the category that best describes the principal type of housing in your community:

_____a. All single-family units

_____b. Predominantly single-family units; some multi-family units

_____c. Evenly divided between single-family and multi-family units

_____d. Predominantly 2-3 family units

_____e. Predominantly larger (4 or more) multi-family units

7. Please enter the following information for the current school year. (If you are unable to make a reasonably accurate estimate, please leave the item blank.)

_____a. Enter the approximate percentage of students in your high school whose total family income is greater than $20,000/year

_____b. Enter the approximate percentage of students in your high school whose total family income is less than $5,000/year

_____c. Enter the approximate percentage of the community work force that is unemployed

8. Approximately what percentage of the graduating classes of 1970 and 1975 remained in the community to live and/or work in the year immediately following graduation?

_____% a. 1970

_____% b. 1975

9. Using available data whenever possible, please enter the following information for the school years indicated:

   a. Enter the approximate per-pupil expenditure in your school district for the years indicated.

   b. Enter the school tax millage rate for the years indicated.

   c. Enter the approximate percentage of full time teaching staff in your high school who held advanced degrees in the years indicated.

   d. If it was necessary to lay off some of your teaching staff in order to balance the school budget, enter the precentage of teachers laid off in your high school in that year.

   e. If it was necessary to hire additional teachers in your high school (excluding hiring for replacement) please enter the number of teachers hired in each of the years indicated.

	1964-1965	1968-1969	1972-1973	1973-1974	1974-1975	1975-1976
a. Per-pupil expenditures						
b. Tax millage						
c. % Advanced degrees						
d. % Staff reduction						
e. Staff increase						

10. Using existing data whenever possible, please complete the following table. If such data are not available, make a reasonably accurate estimate. If you can make only a "wild guess," please leave the item blank.

a. Enter the total number of students enrolled in your high school during the school years indicated in the column headings.

b. During the same years approximately what percentage of the students were enrolled in an academic or college preparatory program?

c. Approximately what percentage of students were enrolled in a business or commercial program?

d. Approximately what percentage of the students were enrolled in other vocational programs?

e. Approximately what percentage of the students were enrolled in a general program? (Please check to make sure the percentages for rows B-E equal 100%.)

f. Approximately what percentage of your enrollment was made up of minority students--e.g., Black or Afro-American, Mexican or Chicano, Puerto Rican, Oriental, and American Indian?

g. Approximately what percentage of your senior class entered a two-year college in the year immediately following graduation?

h. Approximately what percentage of your senior class entered a four-year college in the year immediately following graduation?

	1964-1965	1968-1969	1972-1973	1973-1974	1974-1975	1975-1976
a. Total school enrollment						
b. Students in academic program (%)						
c. Students in commercial program (%)						
d. Students in other vocational programs (%)						
e. Students in general program (%)						
f. Minority enrollment (%)						
g. Students attending two-year college (%)						
h. Students attending four-year college (%)						

11. Has the percentage of students who drop out from your school—excluding those who transfer to other schools—generally increased or decreased since 1965?

_____a. Increased

_____b. Decreased

_____c. Remained the same

12. The following is a list of curriculum characteristics that your school may have introduced or expanded over the last 10 years. Please read each item and circle the number that most appropriately describes your school's effort in the area.

Circle 1 if your school has made a major effort to adopt or expand the characteristic
Circle 2 if your school has made some effort to adopt or expand the characteristic
Circle 3 if your school has made no effort to adopt or expand the characteristic

1	2	3	Emphasis on teaching the basic skills
1	2	3	Use of audio-visual aids in the classroom
1	2	3	Integration of contemporary issues in social studies classes
1	2	3	Essay writing in English classes
1	2	3	Work-study programs
1	2	3	Emphasis on concepts rather than calculation in mathematics classes
1	2	3	Decreasing the total number of course requirements for graduation
1	2	3	Stress on 19th century literature in English classes
1	2	3	Stress on contemporary literature in English classes
1	2	3	Mixed-ability ("heterogeneous") class grouping rather than same-ability ("homogeneous") grouping or tracks
1	2	3	Use of paraprofessionals or teacher's aides
1	2	3	Use of homework assignments to supplement classroom instruction
1	2	3	Use of new edition textbooks
1	2	3	Increasing the total number of course requirements for graduation
1	2	3	Use of "open classroom"--i.e., emphasis on student preferences, nongraded activities, self-help groups
1	2	3	Pass/fail or credit-only grading
1	2	3	Alternative education schools or programs
1	2	3	Nontraditional, nonacademic course offerings--e.g., modern film, photography, studio arts
1	2	3	Decreasing the number of English courses required for graduation
1	2	3	Decreasing the number of mathematics courses required for graduation
1	2	3	Emphasis on vocabulary development in English classes
1	2	3	Emphasis on content rather than form in essay writing--i.e., decreased emphasis on grammar, sentence structure, punctuation

13. Please indicate the course enrollment trends in your high school since 1965 in the following subject areas by circling the appropriate number. (Please consider trends in terms of percentage of the total student body taking the course rather than the actual number of students enrolled from year to year.)

Circle 1 if the enrollment has increased
Circle 2 if the enrollment has remained the same
Circle 3 if the enrollments have decreased by less than 6%
Circle 4 if the enrollments have decreased by 6%-15%
Circle 5 if the enrollments have decreased by more than 15%

1	2	3	4	5	Modern foreign language (French, German, Spanish, Russian)
1	2	3	4	5	Classical languages (Latin, Greek)
1	2	3	4	5	Advanced mathematics (advanced algebra, trigonometry, calculus)
1	2	3	4	5	Geometry
1	2	3	4	5	Senior year English
1	2	3	4	5	Journalism, creative writing

14. Based on your own observations, how would you say that students at your high school in 1976 compare to those of 1965 on the following characteristics? (If you have been at your present school for less than 10 years, please check here ☐ and answer this question in terms of your observations of students in general.)

Circle 1 if this is more characteristic of students in 1965
Circle 2 if there is no difference between 1965 and 1976 students
Circle 3 if this is more characteristic of students in 1976

1	2	3	Strong motivation to get high grades in school
1	2	3	Truancy
1	2	3	Discipline problems
1	2	3	Competition to get into certain colleges
1	2	3	Alcohol and drug problems
1	2	3	School, crime and juvenile delinquency.
1	2	3	Strong motivation to score high on college admission tests
1	2	3	A feeling that education is important preparation for a good job
1	2	3	An enjoyment of educational activities for their own intrinsic value

15. Based on your own observations, how would you say that teachers in your school in 1976 compare to those of 1965 on the following characteristics. (If you were not at this school in 1965 please check here ☐ and respond in terms of your observations of teachers in general.)

Circle 1 if this was more characteristic of teachers in 1965

Circle 2 if there is no difference between the 1965 and 1976 teachers

Circle 3 if this is more characteristic of teachers in 1976

1	2	3	Dedication to teaching
1	2	3	Five or more years of teaching experience
1	2	3	Education beyond the bachelor's level
1	2	3	Desire to enforce high academic standards
1	2	3	Permissiveness in the classroom
1	2	3	Reliance on clerical aides to reduce out-of-class work load
1	2	3	Motivation to spend time with students outside of the classroom
1	2	3	Desire to be liked by students
1	2	3	Emphasis on discipline within the classroom

16. In the following years, which standardized entrance test did most of your college-bound students take?

1964-1965	1970-1971	1975-1976	
____	____	____	a. Most students took the ACT
____	____	____	b. Most students took the SAT
____	____	____	c. Most students took the ACT and the SAT
____	____	____	d. Most students took neither the SAT nor the ACT

17. In the following years, when did most of your college-bound students take the ACT or the SAT?

1964-1965	1970-1971	1975-1976	
____	____	____	a. During their junior year
____	____	____	b. During their senior year
____	____	____	c. About half took the test during their junior year; half during their senior year
____	____	____	d. During <u>both</u> their junior and senior years

18. In your opinion, which one of the following characteristics is most clearly reflected in the SAT or ACT test scores of your students?

_____a. General academic achievement in high school

_____b. Ability to do college level work

_____c. Cultural and family background of the student

_____d. Other (Specify: _____)

19. To what extent has the decline in ACT and SAT test scores throughout the nation been an issue in your school district?

_____a. It has been a major issue

_____b. It has been discussed, but it has not been a major issue

_____c. It has not been an issue at all

20. Do you believe that the decline in SAT and ACT score averages will have a major effect on practices in elementary and secondary education?

_____a. Yes, it will have a major effect on educational practices

_____b. Yes, it will have some effect on educational practices

_____c. No, it will not affect educational practices

_____d. Have not thought about it

21. In your opinion, what are some of the most important factors explaining the decline in SAT and ACT scores?